

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Thomas L. Kelly	) Examiner:
SERIAL NO.:	10/737,088	) A, Phi Dieu Tran
FILED:	December 16, 2003	)
FOR:	HAIL DAMAGE-RESISTANCE ROOF ASSEMBLY AND METHOD FOR MAKING SAME	) Group Art Unit: 3633 ) Confirmation No. 5181 ) )

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**APPEAL BRIEF UNDER 37 C.F.R. §41.37**

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I.     THE REAL PARTY IN INTEREST

The real party in interest in this appeal is Thomas L. Kelly, Applicant.

II. RELATED APPEALS AND INTERFERENCES

An Appeal Brief was previously filed in this Application on July 14, 2008. In view of this Brief, the Examiner reopened prosecution via an Office Action mailed October 9, 2008.

III. STATUS OF CLAIMS

Currently, claims 1-31 are pending. Claims 1-31 are currently rejected, and the rejections of claims 1-31 are respectfully appealed in this Brief.

IV. STATUS OF AMENDMENTS

There have been no amendments filed subsequent to receipt of the most recent Final Office Action dated July 26, 2007.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A concise explanation of the subject matter defined in each of the independent claims 1, 17, 18 and 31 involved in the appeal is provided below:

*Claim 1*

Independent claim 1 claims a "hail resistant roof system."

The hail resistant roof system is recited as comprising, "a roof deck and an insulation layer supported by said roof deck, wherein said insulation layer is more compressible and resilient than said roof deck." A roof deck 12 is illustrated in Figures 1 and 5, which may be an air-sealed deck, which may be either strips of membrane material 14 as shown In Figure 1, a polyurethane foam or other material sufficiently impermeable to create an air sealed deck. It is noted that inherently air sealed decks such as concrete (poured-in-place) are also contemplated. Once the deck or substrate above the deck has been sufficiently air sealed, an insulation layer 16 is loose laid thereupon. The insulation can also be adhered entirely or spot adhered as illustrated at 18 to the air sealed roof deck 12. The insulation is a rigid roof insulation having a minimum one pound density 11/2 inch thickness in expanded polystyrene or polyisocyanurate. Page 3, lines 14-28 and Figures 1 and 5.

The hail resistant roof system is further recited as comprising, "a frangible energy absorbing layer supported by said insulation layer, wherein said energy absorbing layer is of a different material than said insulation layer." Above and supported by the insulation 16 is an impact absorber dissipater 20. In one embodiment absorber/dissipater 20 is gypsum board. The board in one embodiment is about  $\frac{1}{2}$ " thick. In the case of gypsum board, energy absorption/dissipation occurs in the form of a successive breaking of the board which is illustrated in drawings Figures 2, 3 and 4 in sequence. Breakage may be generally concentric or spiral for individual locations. During the rapid stepwise breakage following an impact from a hail stone or other similar object, kinetic energy is absorbed. More

specifically, some of the total kinetic energy of the object is absorbed with each breakage until sufficient kinetic energy has been absorbed that the hailstone can no longer break the board. The stone has thus been effectively stopped. Gypsum board is particularly effective because small sections break at the break site so that the roof structure “bounces back” to some extent. Although three breakages are illustrated in Figures 2-4 this is but one example. More or fewer breakages are possible and correspond to the amount of energy in the solid object. As illustrated, Figure 2 shows one breakage 42; Figure 3 shows two breakages 42 and 44; and Figure 4 shows three breakages 42, 44 and 46. As illustrated sequentially in Figures 2-4, the object 40 is protruding farther into absorber/dissipater 20. Page 3, line 28 through page 4, line 16 and Figures 1-7 (2-4 in particular).

The hail resistant roof system is further recited as comprising an “a waterproof membrane loose laid over said frangible energy absorbing layer.” Referring to Figure 1, a waterproofing membrane 22 is loose laid on absorber/dissipater 20. Further, in one embodiment a wrinkle 24 is intentionally created in membrane 22 to keep additional membrane material “in reserve”. The excess membrane in wrinkle 24 provides material that can be “pulled” by object 40 into a depression created thereby preventing rupture of membrane 22. In combination with wrinkle 24 or in another embodiment not having wrinkle 24, a fold 26 is created for the same purpose as wrinkle 24. In both cases, the provision prevents membrane 22 being held taught. If membrane 22 is taught, it is more likely to rupture because incident to the impact, a depression will be formed in the roof assembly. In the event membrane 22 cannot move into the depression, it will be caused to stretch into the depression, and rapidly, making rupture more likely. The foregoing is illustrated in Figures 2-4 \_wherein the membrane material may be pulled into a depression 48 formed by object 40. Page 4, lines 17-28 and Figures 1-4.

*Claim 17*

Independent claim 17 claims a “wind blown debris resistant roof system.”

The wind blown debris resistant roof system is recited as comprising, “a roof deck, a layer of stiff material attached to said roof deck, and a primary waterproofing membrane supported by said stiff material.” A roof deck 12 is illustrated in Figures 1 and 5, which may be an air-sealed deck, which may be either strips of membrane material 14 as shown In Figure 1, a polyurethane foam or other material sufficiently impermeable to create an air sealed deck. It is noted that inherently air sealed decks such as concrete (poured-in-place) are also contemplated. Once the deck or substrate above the deck has been sufficiently air sealed, an insulation layer 16 is loose laid thereupon. Atop roof deck 12 is a membrane 50 which in one embodiment is adhered to deck 12. As illustrated in Figure 5 the adhesive 52 extends to all locations under membrane 50. It is also possible to spot adhere membrane 50 to deck 12 but is still desirable to maintain the placement of adhesive on deck joints as in Figure 1 to prevent air from migrating to locations under membrane 50 from within the building structure weather sealed by the roof depicted. Page 5, lines 11-16 and Figure 5.

The hail resistant roof system is further recited as comprising “a roof insulation layer that is more compressible and resilient than said roof deck, and a frangible energy adsorbing layer loose laid over the primary water proofing membrane, wherein said energy absorbing layer is of a different material than said insulation layer, and a secondary waterproofing membrane disposed over the frangible energy adsorbing layer.” In the embodiment of Figure 5, membrane 50 provides additional water proofing for the roof in that in the event that wind blown debris impacts the membrane 22 with energy sufficient to rupture membrane 22, membrane 50 will prevent interior building damage until the roof system can be repaired. The system of Figure 5 works identically to that of Figure 1 for smaller impacts but provides the additional protective margin of membrane 50 for eventualities rupturing membrane 22. Page 5, lines 16-21 and Figures 1-5.

*Claim 18*

Independent claim 18 claims a “hail resistant roof system.”

The hail resistant roof system is recited as comprising, “a roof deck, a layer of stiff material attached to said roof deck, and a primary waterproofing membrane supported by said stiff material.” As was discussed with reference to claim 17, the roof deck 12 is illustrated in Figures 1 and 5, which may be an air-sealed deck, which may be either strips of membrane material 14 as shown In Figure 1, a polyurethane foam or other material sufficiently impermeable to create an air sealed deck. It is noted that inherently air sealed decks such as concrete (poured-in-place) are also contemplated. Once the deck or substrate above the deck has been sufficiently air sealed, an insulation layer 16 is loose laid thereupon. Atop roof deck 12 is a membrane 50 which in one embodiment is adhered to deck 12. As illustrated in Figure 5 the adhesive 52 extends to all locations under membrane 50. It is also possible to spot adhere membrane 50 to deck 12 but is still desirable to maintain the placement of adhesive on deck joints as in Figure 1 to prevent air from migrating to locations under membrane 50 from within the building structure weather sealed by the roof depicted. Page 5, lines 11-16 and Figure 5.

The hail resistant roof system is further recited as comprising “a roof insulation layer that is more compressible and resilient than said roof deck, and a frangible energy adsorbing layer loose laid over the primary water proofing membrane, wherein said energy absorbing layer is of a different material than said insulation layer, and a secondary waterproofing membrane disposed over the frangible energy adsorbing layer.” In the embodiment of Figure 5, membrane 50 provides additional water proofing for the roof in that in the event that wind blown debris impacts the membrane 22 with energy sufficient to rupture membrane 22, membrane 50 will prevent interior building damage until the roof system can be repaired. The system of Figure 5 works identically to that of Figure 1 for smaller impacts but provides the additional protective margin of membrane 50 for eventualities rupturing membrane 22. Page 5, lines 16-21 and Figures 1-5.

Claim 31

Independent claim 31 claims a “hail resistant roof system.”

The hail resistant roof system is recited as comprising, “a roof deck and a resilient roof insulation layer disposed upon said roof deck, wherein said insulation layer is at least one of expanded polystyrene (EPS) and polyisocyanurate foam (ISO).” A roof deck 12 is illustrated in Figures 1 and 5, which may be an air-sealed deck, which may be either strips of membrane material 14 as shown In Figure 1, a polyurethane foam or other material sufficiently impermeable to create an air sealed deck. It is noted that inherently air sealed decks such as concrete (poured-in-place) are also contemplated. Once the deck or substrate above the deck has been sufficiently air sealed, an insulation layer 16 is loose laid thereupon. The insulation can also be adhered entirely or spot adhered as illustrated at 18 to the air sealed roof deck 12. The insulation is a rigid roof insulation having a minimum one pound density 1 1/2 inch thickness in expanded polystyrene or polyisocyanurate. Page 3, lines 14-28 and Figures 1 and 5.

The hail resistant roof system is further recited as comprising, “at least .5 inches of gypsum board disposed upon said insulation layer, wherein the insulation layer is configured to compress to allow energy absorption when the gypsum is struck by an object.” Above and supported by the insulation 16 is an impact absorber dissipater 20. In one embodiment absorber/dissipater 20 is gypsum board. The board in one embodiment is about  $\frac{1}{2}$ " thick. In the case of gypsum board, energy absorption/dissipation occurs in the form of a successive breaking of the board which is illustrated in drawings Figures 2, 3 and 4 in sequence. Breakage may be generally concentric or spiral for individual locations. During the rapid stepwise breakage following an impact from a hail stone or other similar object, kinetic energy is absorbed. More specifically, some of the total kinetic energy of the object is absorbed with each breakage until sufficient kinetic energy has been absorbed that the hailstone can no longer break the board. The stone has thus been effectively stopped. Gypsum board is particularly effective because small sections break at the break site so that

the roof structure “bounces back” to some extent. Although three breakages are illustrated in Figures 2-4 this is but one example. More or fewer breakages are possible and correspond to the amount of energy in the solid object. As illustrated, Figure 2 shows one breakage 42; Figure 3 shows two breakages 42 and 44; and Figure 4 shows three breakages 42, 44 and 46. As illustrated sequentially in Figures 2-4, the object 40 is protruding farther into absorber/dissipater 20. Page 3, line 28 through page 4, line 16 and Figures 1-7 (2-4 in particular).

The hail resistant roof system is further recited as comprising an “a loose laid, non-reinforced waterproofing membrane with fabricated wrinkles disposed upon said gypsum board.” Referring to Figure 1, a waterproofing membrane 22 is loose laid on absorber/dissipater 20. Further, in one embodiment a wrinkle 24 is intentionally created in membrane 22 to keep additional membrane material “in reserve”. The excess membrane in wrinkle 24 provides material that can be “pulled” by object 40 into a depression created thereby preventing rupture of membrane 22. In combination with wrinkle 24 or in another embodiment not having wrinkle 24, a fold 26 is created for the same purpose as wrinkle 24. In both cases, the provision prevents membrane 22 being held taught. If membrane 22 is taught, it is more likely to rupture because incident to the impact, a depression will be formed in the roof assembly. In the event membrane 22 cannot move into the depression, it will be caused to stretch into the depression, and rapidly, making rupture more likely. The foregoing is illustrated in Figures 2-4 wherein the membrane material may be pulled into a depression 48 formed by object 40. Page 4, lines 17-28 and Figures 1-4.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

There are multiple grounds of rejection to be reviewed on appeal: the rejection of Claims 18-20 under 35 U.S.C. §103(a) as being unpatentable over Kelly et al. U.S. Patent No. 6,006,482 hereinafter referred to as “Kelly;” the rejection of Claims 1-2, 6, 9-17, and 22-30 under 35 U.S.C. §103(a) as being unpatentable over Kelly, the rejection of Claim 3 under 35 U.S.C. §103(a) as being unpatentable over Kelly, the rejection of Claims 4-5 under 35 U.S.C. §103(a) as being unpatentable over Kelly in view of United States Patent No. 6,250,036 to Nurley (“Nurley” hereinafter); the rejection of Claims 7-8 and 21 under 35 U.S.C. §103(a) as being unpatentable over Kelly in view of United States Patent No. 6,006,482 to Bennett (“Bennett” hereinafter), the rejection of Claim 31 under 35 U.S.C. §103(a) as being unpatentable over Kelly in view of Bennett.

VII. ARGUMENT

A. REJECTION OF CLAIMS 18-20

Claims 18-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kelly.

To establish a *prima facie* obviousness under 35 U.S.C. § 103(a), three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

(i) *The Kelly reference does not teach or suggest all the claim limitations.*

Applicants' claim 18 recites in part,

"multiple stationary nozzle blades supported by a turbine stator ...multiple respective cover portions defining a first surface configured to span tips of multiple adjacent nozzle blades, and...an overcover coupled to a second surface opposite said first surface of said respective cover portions."

"a secondary waterproof membrane *loose laid* over said energy absorbing layer."

Kelly does not teach a secondary waterproof membrane *loose laid* over said energy absorbing layer. Instead, referring to column 9 lines 24-26, Kelly teaches that a screw 20 is "mounted in termination bar 18 and driven through all of the layers of the existing roof deck to secure the entire assembly." As is clearly shown in Figure 31 of Kelly, the screw 20 is disposed through the membrane 9 and into the layers below so as to mechanically secure the

membrane 9 to the layers below the membrane 9. Thus, Kelly teaches a mechanical securing of membrane 9 to the layers below membrane 9 as opposed to the *loose laid* membrane recited in Applicant's claim 18. Applicant respectfully notes that a loose laying of the membrane is important to hail resistance in that a taught membrane is more likely to rupture due to hail impact.

Applicant's claim 18 also recites *inter alia*,

"a primary waterproofing membrane disposed over at least a substantial portion of said roof deck."

Kelly does not teach a primary waterproofing membrane disposed over at least a substantial portion of said roof deck. The Examiner equates the primary water proofing layer of Applicant's claim 18 with "the layer directly above the deck layer" (see page 2 of the Office Action) in Figure 31 of Kelly. However, referring to column 11 lines 7-9, Kelly teaches this layer to be an insulation layer included in the built up roof (BUR) 108. Applicant respectfully submits that it is well known in the art that an insulation layer would not function as a waterproofing layer, as it typically consists of such non-waterproofing materials as gypsum, fiberboard, and wood (see column 5 line 54 of Kelly). Applicant points to Kelly's inclusion of an actual waterproofing membrane 9 as further evidence that the insulation layers 14 (and the insulation layer of 108) of Kelly are not taught for waterproofing purposes.

For at least this reason, Applicant respectfully asserts that Kelly does not teach every element of Applicant's claim 18, or claims 19-20 that depend therefrom. Accordingly, *prima facie* obviousness does not exist regarding claims 18-20 with respect to Kelly. Additionally, since Kelly fails to teach or suggest all of the limitations of claims 18-20, clearly, one of ordinary skill at the time of Applicant's invention would not have a motivation to modify the reference, nor a reasonable likelihood of success in forming the claimed invention by modifying the reference. Thus, here again, *prima facie* obviousness does not exist.

## B. REJECTION OF CLAIMS 1-2, 6, 9-17, AND 22-30

Claims 1-2, 6, 9-17, and 22-30 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kelly.

To establish a *prima facie* obviousness under 35 U.S.C. § 103(a), three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

(i) *The Kelly reference does not teach or suggest all the claim limitations.*

Applicant's claim 1 recites *inter alia*:

"a waterproof membrane loose laid over said frangible energy absorbing layer."

Kelly does not teach a waterproof membrane loose laid over said frangible energy absorbing layer. Instead, referring to column 9 lines 24-26, Kelly teaches that a screw 20 is "mounted in termination bar 18 and driven through all of the layers of the existing roof deck to secure the entire assembly." As is clearly shown in Figure 31 of Kelly, the screw 20 is disposed through the membrane 9 and into the layers below so as to mechanically secure the membrane 9 to the layers below the membrane 9. Thus, Kelly teaches a mechanical securing of membrane 9 to the layers below membrane 9 as opposed to the *loose laid* membrane recited in Applicant's claim 18. Applicant respectfully notes that a loose laying of the membrane is important to hail resistance in that a taught membrane is more likely to

rupture due to hail impact.

For at least this reason, Applicant respectfully asserts that Kelly does not teach every element of Applicant's claim 1, or claims 2, 6, 9-16, and 22-30 that depend therefrom. Accordingly, *prima facie* obviousness does not exist regarding claims 1-2, 6, 9-16, and 22-30 with respect to Kelly. Additionally, since Kelly fails to teach or suggest all of the limitations of claims 1-2, 6, 9-16, and 22-30, clearly, one of ordinary skill at the time of Applicant's invention would not have a motivation to modify the reference, nor a reasonable likelihood of success in forming the claimed invention by modifying the reference. Thus, here again, *prima facie* obviousness does not exist.

Referring now to claim 17, Applicant recites

"a layer of stiff material attached to said roof deck; [and] a primary waterproofing membrane supported by said stiff material."

Kelly does not teach a layer of stiff material attached to a roof deck or a primary waterproofing membrane supported by this stiff material. First Applicant points out that the layer 110, which the Examiner equates with Applicant's "layer of stiff material," is taught in Kelly as a gravel layer 110. In Kelly, this gravel 110 is not taught to be "attached" to anything, but is instead taught to be disposed between layers of insulation 14. As shown in Figure 31, the gravel 110 does not contact the deck 12 (insulation of the BUR 108 being disposed between the deck 12 and the gravel 110), and thus, the gravel layer 110 is not "attached" to the deck 12. Applicant respectfully points out that the gravel 110, due to its nature, could not be "attached" to the deck 12 via the mechanical fastener 20."

Referring to "the primary waterproofing layer supported by the stiff material," the Examiner equates this layer of Applicant's claim 17 with "the layer 14 directly above layer 10" (see page 3 of the Office Action) in Figure 31 of Kelly. However, referring to column 11 lines 7-9, Kelly teaches this layer to be an insulation layer included in the built up roof

(BUR) 108. Applicant respectfully submits that it is well known in the art that an insulation layer would not function as a waterproofing layer, as it typically consists of such non-waterproofing materials as gypsum, fiberboard, and wood (see column 5 line 54 of Kelly). Applicant points to Kelly's inclusion of an actual waterproofing membrane 9 as further evidence that the insulation layers 14 (and the insulation layer of 108) of Kelly are not taught for waterproofing purposes.

For at least these reasons, Applicant respectfully asserts that Kelly does not teach every element of Applicant's claim 17. Accordingly, *prima facie* obviousness does not exist regarding claim 17 with respect to Kelly. Additionally, since Kelly fails to teach or suggest all of the limitations of claim 17, clearly, one of ordinary skill at the time of Applicant's invention would not have a motivation to modify the reference, nor a reasonable likelihood of success in forming the claimed invention by modifying the reference. Thus, here again, *prima facie* obviousness does not exist.

#### C. REJECTION OF CLAIM 3

Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kelly.

As claim 3 depends from claim 1, for at least the reasons discussed in overcoming the rejection of claim 1, Applicant respectfully submits claim 3 is not obvious over Kelly.

#### D. REJECTION OF CLAIMS 4 AND 5

Claims 4 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kelly in view Nurley.

As claims 4 and 5 depend from claim 1, for at least the reasons discussed in overcoming the rejection of claim 1, Applicant respectfully submits claims 4 and 5 are not

obvious over Kelly. Furthermore, since Nurley is not used by the Examiner to remedy the above-discussed deficiencies of Kelly as they relate to claim 1, Applicant respectfully submits that any proposed combination of Kelly and Nurley does not teach every element of Applicant's claims 4 and 5, and therefore, *prima facie* obviousness does not exist regarding claims 4 and 5 with respect to any proposed combination of Kelly and Nurley. Additionally, since any proposed combination of Kelly and Nurley fails to teach or suggest all of the limitations of claim 4 and 5, clearly, one of ordinary skill at the time of Applicant's invention would not have a motivation to modify or combine the references, nor a reasonable likelihood of success in forming the claimed invention by modifying or combining the references. Thus, here again, *prima facie* obviousness does not exist.

#### E. REJECTION OF CLAIMS 7-8 and 21

Claims 7-8 and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kelly in view Bennett.

Claims 7 and 8 depend from claim 1, and claim 21 depends from claim 18. As such, for at least the reasons discussed in overcoming the rejection of claims 1 and 18, Applicant respectfully submits claims 7-8 and 21 are not obvious over Kelly. Furthermore, since Bennett is not used by the Examiner to remedy the above-discussed deficiencies of Kelly as they relate to claims 1 and 18, Applicant respectfully submits that any proposed combination of Kelly and Bennett does not teach every element of Applicant's claims 7-8 and 21, and therefore, *prima facie* obviousness does not exist regarding claims 7-8 and 21 with respect to any proposed combination of Kelly and Bennett. Additionally, since any proposed combination of Kelly and Bennett fails to teach or suggest all of the limitations of claims 7-8 and 21, clearly, one of ordinary skill at the time of Applicant's invention would not have a motivation to modify or combine the references, nor a reasonable likelihood of success in forming the claimed invention by modifying or combining the references. Thus, here again, *prima facie* obviousness does not exist.

#### G. REJECTION OF CLAIM 31

Claim 31 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kelly in view of Pearson and Bennett.

Similarly to claims 1 and 18, claim 31 recites, *inter alia*,

“a loose laid, non-reinforced waterproofing membrane with fabricated wrinkles disposed upon said gypsum board.”

As is discussed at length with regards to claims 1 and 18, none of Kelly, Bennett, and Pearson, taken alone or in combination, teach a loose laid, non-reinforced waterproofing membrane with fabricated wrinkles disposed upon said gypsum board. Instead, referring to column 9 lines 24-26, Kelly teaches that a screw 20 is “mounted in termination bar 18 and driven through all of the layers of the existing roof deck to secure the entire assembly.” As is clearly shown in Figure 31 of Kelly, the screw 20 is disposed through the membrane 9 and into the layers below so as to mechanically secure the membrane 9 to the layers below the membrane 9. Thus, Kelly teaches a mechanical securing of membrane 9 to the layers below membrane 9 as opposed to the *loose laid* membrane recited in Applicant’s claim 18. Applicant respectfully notes that a loose laying of the membrane is important to hail resistance in that a taught membrane is more likely to rupture due to hail impact.

For at least this reason, Applicant respectfully submits that any proposed combination of Kelly, Pearson, and Bennett does not teach every element of Applicant’s claim 31, and therefore, *prima facie* obviousness does not exist regarding claim 31 with respect to any proposed combination of Kelly, Pearson, and Bennett. Additionally, since any

proposed combination of Kelly, Pearson, and Bennett fails to teach or suggest all of the limitations of claim 31, clearly, one of ordinary skill at the time of Applicant's invention would not have a motivation to modify or combine the references, nor a reasonable likelihood of success in forming the claimed invention by modifying or combining the references. Thus, here again, *prima facie* obviousness does not exist.

VIII. CLAIMS APPENDIX

Claim 1. A hail resistant roof system comprising:

- a roof deck;
- an insulation layer supported by said roof deck, wherein said insulation layer is more compressible and resilient than said roof deck;
- a frangible energy absorbing layer supported by said insulation layer, wherein said energy absorbing layer is of a different material than said insulation layer; and
- a waterproof membrane loose laid over said frangible energy absorbing layer.

Claim 2. A hail resistant roof system as claimed in Claim 1 wherein said energy absorbing layer is gypsum board.

Claim 3. A hail resistant roof system as claimed in Claim 2 wherein said gypsum board is  $\frac{1}{2}$  inch thick.

Claim 4. A hail resistant roof system as claimed in Claim 1 wherein said membrane is fiberglass reinforced.

Claim 5. A hail resistant roof system as claimed in Claim 1 wherein said membrane is about 80 mil fiberglass reinforced or thicker.

Claim 6. A hail resistant roof system as claimed in Claim 1 wherein joints in said insulation layer are offset from joints in said energy absorbing layer.

Claim 7. A hail resistant roof system as claimed in Claim 1 wherein said insulation is of a resilient material.

Claim 8. A hail resistant roof system as claimed in Claim 7 wherein said resilient

material is about 1.5 inches thick or more.

Claim 9. A hail resistant roof system as claimed in Claim 1 wherein said deck or substrate is air sealed.

Claim 10. A hail resistant roof system as claimed in Claim 1 wherein said membrane is air sealed to a wall structure.

Claim 11. A hail resistant roof system as claimed in Claim 1 wherein said membrane is installed with at least one intentional wrinkle to allow for gathering of membrane at hail impact depressions and to compensate for shrinkage of said membrane over time.

Claim 12. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located within a field of said membrane.

Claim 13. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located at a perimeter edge of said roof deck.

Claim 14. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located at penetrations or protrusions of said roof membrane.

Claim 15. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is located at both a field of said membrane and perimeter edge of said roof deck.

Claim 16. A hail resistant roof system as claimed in Claim 11 wherein said at least one wrinkle is adhered to an underlying layer of said system with an adherent composed to yield to shear force thereon.

Claim 17. A wind blown debris resistant roof system comprising:

a roof deck;  
a layer of stiff material attached to said roof deck;  
a primary waterproofing membrane supported by said stiff material; and  
a roof insulation layer that is more compressible and resilient than said roof deck,  
and a frangible energy adsorbing layer loose laid over the primary water proofing  
membrane, wherein said energy absorbing layer is of a different material than said insulation  
layer; and  
a secondary waterproofing membrane disposed over the frangible energy adsorbing  
layer.

Claim 18. A hail resistant roof system comprising:

a roof deck or air sealed substrate;  
a primary waterproofing membrane disposed over at least a substantial portion of  
said roof deck or air seal substrate;  
an insulation layer loose laid over primary waterproofing membrane;  
an energy absorbing layer supported by said insulation layer, wherein said energy  
absorbing layer is of a different material than said insulation layer; and  
a secondary waterproof membrane loose laid over said energy absorbing layer.

Claim 19. A hail resistant roof system as claimed in Claim 18 wherein said energy  
absorbing layer is gypsum board.

Claim 20. A hail resistant roof system as claimed in Claim 18 wherein joints in said  
insulation layer are offset from joints in said energy absorbing layer.

Claim 21. A hail resistant roof system as claimed in Claim 18 wherein said insulation is  
of a resilient material.

Claim 22. A hail resistant roof system as claimed in Claim 1 wherein said deck is air

sealed.

Claim 23. A hail resistant roof system as claimed in Claim 1 wherein said membrane is air sealed to a wall structure.

Claim 24. A hail resistant roof system as claimed in Claim 1 wherein said membrane is installed with at least one intentional wrinkle to allow for gathering of membrane at hail impact depressions and to compensate for shrinkage of said membrane over time.

Claim 25. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located within a field of said membrane.

Claim 26. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located at a perimeter edge of said roof deck.

Claim 27. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located at penetrations or protrusions of said roof membrane.

Claim 28. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is located at both a field of said membrane and perimeter edge of said roof deck.

Claim 29. A hail resistant roof system as claimed in Claim 24 wherein said at least one wrinkle is adhered to an underlying layer of said system with an adherent composed to yield to shear force thereon.

Claim 30. A hail resistant roof system as claimed in Claim 1 further comprising a preexisting roof assembly that is air sealed underlying at least the energy absorbing layer.

Claim 31 A hail resistant roof system comprising:

a roof deck;

a resilient roof insulation layer disposed upon said roof deck, wherein said insulation layer is at least one of expanded polystyrene (EPS) and polyisocyanurate foam (ISO);

at least .5 inches of gypsum board disposed upon said insulation layer, wherein the insulation layer is configured to compress to allow energy absorption when the gypsum is struck by an object; and

a loose laid, non-reinforced waterproofing membrane with fabricated wrinkles disposed upon said gypsum board.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.

XI. CONCLUSION

For the reasons cited above, Appellants respectfully submit that the outstanding rejections are improper and requests reversal thereof. The Office is invited to contact Appellants' attorney at the below-listed telephone number regarding this Appeal Brief or otherwise concerning the present application for patent. Appellants hereby petition under 37 C.F.R. §1.136 and/or §1.137 for any extension of time necessary for entry and consideration of this Appeal Brief. If there are any additional charges with respect to this Appeal Brief, or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Appellants' attorneys.

Respectfully submitted,

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